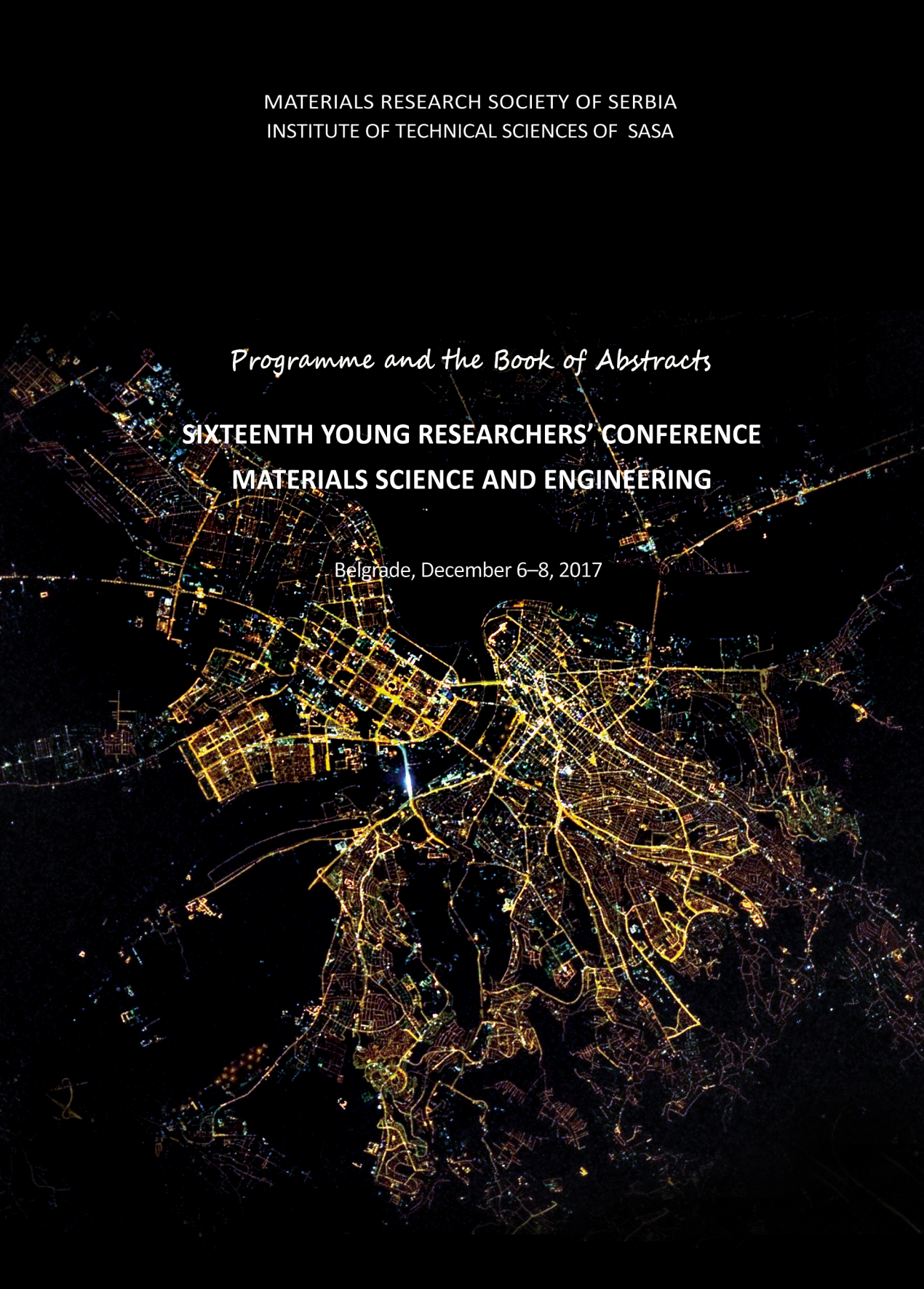
MATERIALS RESEARCH SOCIETY OF SERBIA
INSTITUTE OF TECHNICAL SCIENCES OF SASA



Programme and the Book of Abstracts

SIXTEENTH YOUNG RESEARCHERS' CONFERENCE
MATERIALS SCIENCE AND ENGINEERING

Belgrade, December 6–8, 2017

SIXTEENTH YOUNG RESEARCHERS' CONFERENCE

MATERIALS SCIENCE AND ENGINEERING

December 6-8, 2017, Belgrade, Serbia

Program and the Book of Abstracts

Materials Research Society of Serbia
&
Institute of Technical Sciences of SASA

November 2017, Belgrade, Serbia

Book title:
Sixteenth Young Researchers' Conference - Materials Science and Engineering:
Program and the Book of Abstracts

Publisher:
Institute of Technical Sciences of SASA
Knez Mihailova 35/IV, 11000 Belgrade, Serbia
Tel: +381-11-2636994, 2185263, http://www.itn.sanu.ac.rs

Editor:
Dr. Smilja Marković

Technical Editor:
Aleksandra Stojičić

Cover page: Aleksandra Stojičić and Milica Ševkušić
Front cover: Modified photo by Anatoly Alekseyevich Ivanishin, Exploration 30 ISS Mission, NASA; Wikimedia Commons (https://commons.wikimedia.org/wiki/File:Warp_Belgrade_Nightscene_April_2012spatial_subset.jpg); Public domain
Back cover: Modified Photo by Hons084; Wikimedia Commons (https://commons.wikimedia.org/wiki/File:Widoki_z_twierdzy_Forte_Mare_na_Herceg_Novi_03.jpg); CC BY-SA 4.0

Printer:
Gama digital centar
Autoput No. 6, 11070 Belgrade, Serbia
Tel: +381-11-6306992, 6306962, http://www.gdc.rs

Edition:
130 copies

CIP - Каталогизација у публикацији - Народна библиотека Србије, Београд

66.017/.018(048)

YOUNG Researchers Conference Materials Sciences and Engineering (16 ; 2017 ; Beograd)

Program ; and the Book of Abstracts / Sixteenth Young Researchers' Conference Materials Sciences and Engineering, December 6-8, 2017, Belgrade, Serbia ; [organized by] Materials Research Society of Serbia & Institute of Technical Sciences of SASA ; [editor Smilja Marković]. - Belgrade : Institute of Technical Sciences of SASA, 2017 (Beograd : Gama digital centar). - XVIII, 78 str. ; 23 cm

Tiraž 130. - Registar.

ISBN 978-86-80321-33-2
1. Društvo za istraživanje materijala Srbije (Beograd) 2. Institut tehničkih nauka SANU (Beograd)
a) Наука о материјалима - Апстракти b) Технички материјали - Апстракти
COBISS.SR-ID 250864908

Aim of the Conference

Main aim of the conference is to enable young researchers (post-graduate, master or doctoral student, or a PhD holder younger than 35) working in the field of materials science and engineering, to meet their colleagues and exchange experiences about their research.

Topics

Biomaterials
Environmental science
Materials for high-technology applications
Nanostructured materials
New synthesis and processing methods
Theoretical modelling of materials

Scientific and Organizing Committee

Siniša Vučenović	Faculty of Sciences, Department of Physics, Banja Luka, B&H
Marija Vukomanović	Institute Jožef Stefan, Ljubljana, Slovenia

Conference Secretary

Aleksandra Stojičić	Institute of Technical Sciences of SASA, Belgrade, Serbia

Conference Technical Committee

Milica Ševkušić, Vuk Radmilović, Miloš Milović, Sonja Jovanović, Ivana Dinić, Veljko Đokić.

Results of the Conference

Beside printed «Program and the Book of Abstracts», which is disseminated to all conference participants, selected and awarded peer-reviewed papers will be published in journals "Tehnika – Novi Materijali" and "Processing and Application of Ceramics". The best presented papers, suggested by Session Chairpersons and selected by Awards Committee, will be proclaimed at the Closing Ceremony. Part of the award is free-of-charge conference fee at YUCOMAT 2018.

Sponsors

Acknowledgement

The editor and the publisher of the Book of abstracts are grateful to the Ministry of Education, Sciences and Technological Development of the Republic of Serbia for its financial support of this book and The Sixteenth Young Researchers' Conference - Materials Sciences and Engineering, held in Belgrade, Serbia.

2-4

Biodegradable polymer/hydrogel composite for controlled delivery of cationic formulations

Željko Janićijević,[1] Marina Ninkov,[2] Milena Kataranovski,[2] Filip Radovanović[3]
[1]School of Electrical Engineering, University of Belgrade, Belgrade, Serbia, [2]Department of Ecology, Institute for Biological Research "Siniša Stanković", University of Belgrade, Belgrade, Serbia, [3]Institute of Technical Sciences of SASA, Belgrade, Serbia

Composites of biodegradable polymers and hydrogels are promising materials for controlled delivery systems with prolonged drug release. In this contribution, we present an innovative implant design comprising poly(DL-lactide-co-ε-caprolactone) copolymer base and a crosslinked poly(acrylic acid) hydrogel. Implants were prepared in the form of disks using the modified traditional liquid phase inversion process. Solutions containing all implant precursors were dispensed into transparent non-stick molds and cured by UV irradiation. UV curing was followed by immersion into the phosphate buffer solution bath to achieve phase separation and solidification. Structure and composition of the implant were characterized using SEM and FTIR. Obtained implants exhibited high loading capacity for cationic formulations and a moderate degree of swelling. Studies of implant loading and subsequent release of methylene blue into the phosphate-buffered saline demonstrated diffusion-controlled delivery kinetics over a period of several weeks. To assess biocompatibility of implants as possible materials for drug delivery systems in mammals, we evaluated their effects on viability (Trypan blue exclusion assay), metabolic activity, proliferation (MTT assay) and priming (nitric oxide/NO production) of freshly isolated rat splenocytes during 24 h and 48 h of cultivation. The viability was unaltered, metabolic activity/proliferation was increased after 48 h and the decrease of NO production, as well as drop in responsiveness to cell mitogen concanavalin A (ConA) in cells on implants were observed. These results suggest that implants could be used as a suitable material for drug delivery systems, but their capacity to stimulate cell proliferation and their immunosuppressive potential deserve further investigations.